

## CLAIMS

### WHAT IS CLAIMED IS:

1           1.       (Currently Amended) A method for providing precise control of a magnetic  
2 coupling field in a NiMn top spin valve head, comprising:  
3           forming ~~at least one~~ a copper seed layer in a NiMn top spin valve;  
4           oxidizing the ~~at least one~~ copper seed layer in the NiMn top spin valve; and  
5           depositing remaining layers of the NiMn top spin valve head including a NiMn  
6 pinning layer having a thickness of less than 200 Å.

1           2.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ copper  
2 seed layer is naturally oxidized for 80 seconds under  $8 \times 10^{-5}$  Torr of oxygen pressure.

1           3.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer reduces the ferromagnetic coupling field without deteriorating GMR effect  
3 or resistance.

1           4.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer provides a negative coupling field without affecting GMR effect or  
3 resistance.

1           5.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer changes the crystalline texture growth of subsequent magnetic layers.

1           6.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer provides a negative coupling field that is achieved without affecting a  
3 GMR effect or resistance of the NiMn top spin valve head.

1           7.       (Currently Amended) The method of claim 6 wherein the ~~at least one~~ oxidized  
2 copper seed layer provides stronger growth of NiFe(111) and NiMn(111) with respect to  
3 NiFe(200) and NiMn(002) phases.

1           8.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer improves the interfacial roughness.

1           9.       (Currently Amended) The method of claim 1 wherein the ~~at least one~~ oxidized  
2 copper seed layer prior to deposition of magnetic free layers.

1           10.      (Cancelled)

1           11.      (Cancelled)

1           12.      (Currently Amended) The method of claim 1 wherein the oxidation of the ~~at~~  
2 ~~least one~~ copper seed layer provides an approximately 15% increase in amplitude of the  
3 output of the NiMn spin valve head at the same coupling field.

1           13.      (Currently Amended) The method of claim 12 wherein the oxidation of the ~~at~~  
2 ~~least one~~ copper seed layer does not affect asymmetry performance.

1           14.      (Cancelled)

1            15.    (Cancelled)